REMARKS

Claims 1-99 are currently pending in this application and have all been rejected under 35 USC 102(b). Claims 1, 4, 10, 13-15, 17, 20, 22, 23, 26, 27, 29-34, 36, 37, 43, 46-50, 53, 55-57, 59-67, 70, 76, 79-81, 83, 86, 89, 90, 92, and 95-99 have been amended. Claims 2, 8, 9, 12, 21, 35, 41, 42, 45, 54, 68, 74, 75, 78, and 87 have been cancelled without prejudice. No new matter has been added.

The Applicants thank the Examiner for allowing the telephone Interview on December 14, 2008. The Applicant submits this Response in accordance with the discussions conducted during that Interview.

The Applicant amends independent claim 1 based on the features of original claims 2, 8, 9 and 12 and paragraph [0045] of the description. As a result the Applicant cancels claims 2, 8, 9 and 12. A clarifying amendment has been made to dependent claims 4, 10, 14, 15 & 17.

Corresponding amendments have been made to the other independent method claims 20, 26 & 30 resulting in the cancellation of dependent claim 21.

Similar amendments have been made in the computer program product claims 34-66 and the apparatus claims 67-99.

35 USC 102 - Barrio

The Examiner rejects current claims 1-99 under 35 USC 102(b) as being anticipated by Barrio, "Study of the Techniques for Emulation Programming", The Technical University of Catalonia.

In particular the Examiner draws attention to page 24, Section 8 of Barrio and the passage which reads:

> Testing is very important in emulation and very hard too. For example to properly test a CPU emulator it would mean to generate all the possible instructions which can receive the CPU and compare the result in the emulator with the real result. It will be also needed to test combinations of instructions because of side effects (flags for

> example) of the instructions. The interrupt system, the exceptions, the access to memory or to the other devices, if the cycle count is being done correctly, everything should be tested and work well. Something similar happens with the sound and graphic hardware and all the other devices.

Section 2 of the present Office Action responds to the detailed arguments put forward by the Applicant that citation of Barrio is improper. Here, the Examiner maintains the novelty rejection principally on the grounds that:

> A local execution, X-X, as of the claim does not make it patentability over variable X-Y because in expression if one (i.e. Barrio and its users) set X=Y then the Applicants' claims remain belonged to or localized to the teaching of X-Y.

The Applicant respectfully disagrees with this reasoning and maintain the arguments put forward previously.

Also, the Applicant respectfully submits that the amended claims are clearly distinguished over the teachings of Barrio.

Within the Barrio citation there are three separate portions each of which discuss testing of an emulator. Firstly, an overview is provided in Chapter 2.8 "Testing the Emulator" on page 24 as referenced by the Examiner and quoted in part above. Secondly, there is a paragraph at page 62 in Chapter 3.4 "Using Library CPU Cores" which discusses using a trusted library CPU core to assess a newly developed CPU core. Thirdly, a longer discussion of testing is found at Chapter 8.2 "Testing and Debugging" on pages 138-139. It would appear that no other portions of Barrio are relevant to testing of an emulator. In particular, the other referenced portions of Barrio such as at pages 10, 18, 22 or 23 do not concern testing of the emulator.

Looking at the revised claim 1, we submit that Barrio does not disclose "dividing subject code into a plurality of blocks and executing one of the blocks of subject code through an emulator in a process image on a subject processor according to an emulation context up until a comparable point in the subject code to provide an emulated machine state..." as recited in step (a) of claim 1.

Secondly, Barrio does not disclose "performing a context switch to a native context and executing the same block of subject code natively in the same process image on the same subject

processor up until the same comparable point in the subject code to provide a native machine state..." as recited in step (b) of claim 1. Here, concerning the rejection of claim 8 in the Office Action, page 10 of Barrio teaches that the emulator functions as a virtual machine. However, this is irrelevant to the feature of executing the subject code natively and through the emulator both within a single process image of the subject processor as now recited in claim 1. Similarly, the Examiner's analysis of original claim 9 refers to page 18 and page 43 of Barrio concerning "getContext()...", which is irrelevant to the question of testing the emulator. In particular, "getContext()" in Barrio concerns switching between different emulated contexts. It does not concern switching between an emulated context and a native context within a single process image as recited in claim 1.

Thirdly, Barrio does not disclose "comparing the native machine state from execution of the one block of subject code natively on the subject processor against the emulated machine state from execution of the same block of subject code on the same subject processor through the emulator at the comparable point in the subject code..." as recited in step (c) of claim 1.

Fourthly, Barrio does not disclose that "the native machine state includes a native memory image and the emulated machine state includes an emulated memory image and the step (a) and/or the step (b) includes selectively isolating access to a memory associated with the subject processor to obtain the native memory image and the emulated memory image, respectively..." as recited in claim 1.

The Applicant respectfully submits that Barrio discloses none of these features as recited in claim 1. Therefore, the rejection of claim 1 as being anticipated by Barrio is improper and should be withdrawn.

Similarly, looking at claim 20, Barrio does not disclose the step of "dividing subject code into a plurality of blocks and performing program code conversion to convert one of the plurality of blocks of subject code into target code through an emulator running in a process image on a subject processor according to an emulation context and executing the target code to provide an emulated machine state including selectively inhibiting access by the emulator to a memory associated with the subject processor by buffering load and store requests from the subject processor to the memory in a load/store buffer...". Further, Barrio does not disclose the step of:

"switching to a native context and executing the same one block of subject code directly in the same process image on the same subject processor to provide a native machine state that is stored in the memory associated with the same subject processor...". Further still, Barrio does not disclose "comparing the emulated machine state contained in the load/store buffer against the native machine state contained in the memory to verify the program code conversion...". Thus, the rejection of claim 20 as being anticipated by Barrio is improper and should be withdrawn.

Looking now at claim 26, Barrio does not disclose "first dividing subject code into a plurality of blocks and comparing execution of one subject code block natively on a subject processor against execution of the same subject code block on the same subject processor through a first emulator both in a single process image, thereby verifying program code conversion performed by the first emulator...". Further, Barrio does not disclose "also comparing execution of same subject code block through the first emulator running on the subject processor against execution of the same subject code block through a second emulator running on a target processor, thereby verifying program code conversion performed by the second emulator using the verified program code conversion performed by the first emulator..." as recited in claim 26. Thus, the rejection of claim 26 as being anticipated by Barrio is improper and should be withdrawn.

Finally, looking at claim 30, we respectfully submit that Barrio discloses none of the recited steps (a) through (e) of claim 30. That is, Barrio does not disclose "dividing subject code into a plurality of blocks, wherein each block includes at least one instruction ..." as recited in step (a) of claim 30. Further, Barrio does not disclose "executing one of the blocks of subject code in a process image on a subject processor through a first emulator according to an emulation context ..." as recited in step (b) of claim 30. Further still, Barrio does not disclose "switching to a native context, executing the one block of subject code natively on the same subject processor in the same process image and comparing the native execution against the execution of the same one block of subject code on the same subject processor through the first emulator, thereby verifying program code conversion of the block of subject code performed by the first emulator..." as recited in step (c) of claim 30. Further still Barrio does not disclose "comparing execution of the same one block of subject code through a second emulator running

on a target processor against the already verified execution of the same one block of subject code through the first emulator running on the subject processor, thereby verifying program code conversion of the one block of subject code performed by the second emulator..." as recited in step (d) of claim 30. Finally, Barrio does not disclose "repeating the steps (b)-(d) for each of the plurality of blocks of the subject code until program code conversion performed by the second emulator is verified for each of the plurality of blocks of the subject code..." as recited in step (e) of claim 30. Thus, the rejection of claim 30 as being anticipated by Barrio is improper and should be withdrawn.

Claims 3-7, 10, 11, 13-19 depend from allowable claim 1. Claims 22-25 depend from allowable claim 20. Claims 27-29 depend from allowable claim 26. Claims 31-33 depend from allowable claim 30. These dependent claims recite further novel features of the invention which are not disclosed in Barrio. However, these dependent claims are allowable not least because they each depend from an allowable independent claim, so the rejections of these dependent claims should be withdrawn.

Claims 34-66 and claims 67-99 are allowable for like reasons to claims 1-33 discussed in detail above.

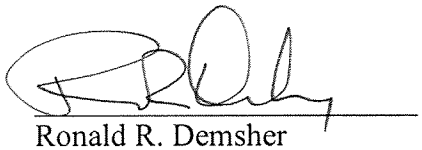
It is important to recognise that the claimed invention represents a significant step forward over the previously available testing mechanisms as discussed in Barrio. Indeed, Barrio recognizes exactly the problems which are solved by the present invention, namely that "testing is very important in emulation and very hard too (page 24)". "We will just introduce those topics but they would need further talk because is the hardest task involved with emulation and mean a lot of hours of patient work (page 25)". Instead, those hours of patient work are avoided in the present invention precisely by the features recited in claim 1 and the other independent claims. These advantages of the present invention lead to a significant reduction in the time, effort and expense required for testing a newly developed emulator.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0219, under Order No. 1801270.00131US1 from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: February 11, 2008



Ronald R. Demsher
Registration No.: 42,478
Attorney for Applicant(s)

Wilmer Cutler Pickering Hale and Dorr LLP
60 State Street
Boston, Massachusetts 02109
(617) 526-6000 (telephone)
(617) 526-5000 (facsimile)